Coherent States and Kahler Manifolds for a Long Time Evolution Problem and Quantum Localization on Classical Trajectories (Microlocal Analysis and PDE in the Complex Domain)

AUTHOR(S):

Karasev, M.

数理解析研究所講究録
1159 巻 2000 年 1-3

Coherent States and Kähler Manifolds for a Long Time Evolution Problem and Quantum Localization on Classical Trajectories

M. Karasev
(Moscow Institute of Electronics and Mathematics)

M. KARASEV. Coherent states and Kähler manifolds for a long time evolution problem, and localization on classical trajectories.

Abstract

Quantum integrable system + perturbation, under a long time evolution, is reduced to a quantum system on the manifold of integlas of motion. Quantum tensor on this manifold can be, in general, highly nonlinear, for instance, it is quadratic in the case of the Hydrogen atom in a magnetic field.

Irreducible representations of algebra of integrals of motion are controled by symplectic leaves in this manifold. The leaves carry the Kahlerian structure with respect to which irreducible representations are given by differential (not pseudodifferential) operators.

In these representations the quantum system is reduced to certain versions and generalizations

of the hypergeometric equation, for instance, to Heun equation in the case of Hydrogen + magnetic field. These equations are represented (exactly) on Hamilton trajectories and can be asymptotically solved using the localization and deformation of coherent states along trajectories.

M. Karasev